2012 Chem 112 Exam 5 Review

Chapter 10

1. What are the different types of energy?

2. How do you know if a process is endothermic or exothermic?

3. What is thermochemistry?

4. First Law of Thermodynamics aka: the law of conservation of energy

5. The difference between the system and the surroundings

6. Be able to write a thermochemical equation (includes ΔH)

7. Be able to write a reaction for
   A. Enthalpy of formation
   B. Enthalpy of ionization (dissolution or solution)
   C. Enthalpy of neutralization
   D. Enthalpy of vaporization
   E. Enthalpy of sublimation
   F. Enthalpy of fusion

8. When talking about heat flow (q) the q of the system = -q of the surroundings

9. Heat (q)
   A. $q = mc\Delta T$ when using specific heat
   B. $q = C\Delta T$ when using heat capacity
   C. $q = n\Delta H$ when working with heat (enthalpy of reaction, solution or formation)
   D. Make sure the values match

10. Hess's Law (Third law of thermodynamics)
    A. The ΔH of a process is equal to the sum of the steps involved
    B. If a process is reversed than the sign of ΔH is flipped
    C. If a step has to be doubled or tripled etc then ΔH is doubled or tripled etc

11. $\Delta H_{reaction} = \Sigma V_p * \Delta H_f$ (products) $- \Sigma V_r * \Delta H_f$ (reactants)

Chapter 11

1. Characteristics of a gas
    A. A sample of gas assumes both the shape and volume of the container
    B. Gases are compressible
    C. The densities of gases are much smaller than those of liquids and solids and are highly variable depending on temperature and pressure
    D. Gases form homogeneous mixtures (solutions) with one another in any proportion

2. Boyle's Law
   For a fixed amount of gas at a constant temperature Pressure is inversely related to Volume
   Therefore $P_1V_1 = P_2V_2$

3. Charles Law
   The volume of a fixed amount of gas at constant pressure is directly proportional to temperature. Therefore $V_1/T_1 = V_2/T_2$

4. Avogadro's Law
    A. The volume of a gas at a given temperature and pressure is directly proportional to the quantity of the gas
    B. Mole ratios of gases in a balanced chemical equation is equal to volume ratios
    C. 1 mole of any gas at STP is 22.4 L
    D. The same moles of any gas will exert the same pressure

6. Ideal Gas Law
    a. PV = nRT where P is pressure in atm; V is volume in L; n is moles; R is the gas constant 0.0821 L atm/ mol K and Temperature is in Kelvin
    b. Be able to use the ideal gas law and stoichiometry
    c. What makes a gas "ideal"

7. Dalton's Law of partial pressure: $P_A = \chi_A P_T$
   The total pressure in a container is equal to the sum of the individual partial pressures of each of the gases present in the container
    A. Find information about gas collected over water
    B. Find the individual pressure of a gas in a tank

8. Van der Waal's Eqn and Non-Ideal Gases
    A. every gas deviates from ideal behavior especially at high pressures
    B. takes into account attractive forces between molecules (a) and molecular volumes (b)
    C. Be able to use the equation that will be given to you